

WHAT IS CLAIMED IS:

1. A method for data distribution and recovery comprising the steps of:
 - (a) attaching unique sequence numbers to data packets;
 - (b) broadcasting the data packets from a server to a plurality of clients

5 and an archive;

- (c) storing the data packets with their attached unique sequence numbers;
 - (d) monitoring for a missing sequence number at a client;
 - (e) sending a query from the client that requests re-transmission of a missing data packet having the missing sequence number; and
 - 10 (f) transmitting to the client the missing data packet.

2. The method of claim 1, wherein the archive stores the data packets with their attached unique sequence numbers, receives the query from the client, and transmits to the client the missing data packet.

3. The method of claim 1, wherein the server stores the data packets with their
15 attached unique sequence numbers, receives the query from the client, and transmits to the client the missing data packet.

4. The method of claim 1, wherein the unique sequence numbers identify the data packets and denote an order in which the data packets are broadcast.

5. The method of claim 4, wherein the unique sequence numbers contain enough
20 digits to ensure that no two data packets receive identical sequence numbers.

6. The method of claim 4, wherein the unique sequence numbers are 32-bit sequence numbers.

7. The method of claim 1, wherein the step of monitoring for a missing sequence number at the client comprises the steps of:

(i) receiving a first data packet and recording a first unique sequence number associated with the first data packet;

5 (ii) receiving a second data packet and recording a second unique sequence number associated with the second data packet;

(iii) comparing the first unique sequence number to the second unique sequence number; and

10 (iv) if the second unique sequence number is not in sequence after the first unique sequence number, then determining that the client is missing a sequence number.

8. The method of claim 7, further comprising the step of:

15 (v) if the second unique sequence number is in sequence after the first unique sequence number, then determining that the client is not missing a sequence number.

9. The method of claim 1, wherein the step of broadcasting the data packets from a server to a plurality of clients and an archive further comprises the step of:

waiting, at the server, for an acknowledgement from the archive for each individual data packet of the data packets,

20 wherein if the server receives the acknowledgement, then the archive stores the individual data packet, and

wherein if the server does not receive the acknowledgement, then the server stores the individual data packet.

10. The method of claim 9, wherein the step of sending a query comprises sending the query from the client to the archive, and

5 wherein, if the archive does not respond or if the archive does not have the missing data packet, then the step of sending a query further comprises sending the query to the server.

11. The method of claim 10, wherein, if the archive has the missing data packet, then the archive transmits the missing data packet to the client.

10 12. The method of claim 11, wherein the archive transmits the missing data packet to the client in a point-to-point communication.

13. The method of claim 11, wherein the archive transmits the missing data packet to the client in a broadcast communication using subject-based addressing.

14. The method of claim 10, wherein, if the server has the missing data packet, 15 then the server transmits the missing data packet to the client.

15. The method of claim 14, wherein the server transmits the missing data packet to the client in a point-to-point communication.

16. The method of claim 14, wherein the server transmits the missing data packet to the client in a broadcast communication using subject-based addressing.

20 17. A system for data distribution and recovery comprising:

(a) a server having broadcast messaging software;

(b) a plurality of clients in communication with the server through the broadcast messaging software; and

(c) an archive in communication with the server through the broadcast messaging software, and in communication with the plurality of clients, wherein the
5 archive stores data broadcast by the server,

wherein the server receives a data packet, attaches a unique sequence number to the data packet, and broadcasts the data packet to the plurality of clients and the archive using the broadcast messaging software,

wherein the archive receives and stores the data packet broadcast by the
10 server, and

wherein each client of the plurality of clients receives the data packet broadcast by the server, uses the unique sequence number to determine whether a previous data packet is missing, and, if the previous data packet is missing, requests the previous data packet from the archive.

15 18. The system of claim 17, wherein the archive is also in communication with the server through point-to-point communication, and

wherein the archive provides the server with an acknowledgement to indicate that the archive has received data broadcast by the server.

19. The system of claim 17, wherein each client of the plurality of clients

20 requests the previous data packet through a point-to-point communication with the archive.

20. The system of claim 17, wherein each client of the plurality of clients requests the previous data packet through a broadcast communication with the archive.

21. The system of claim 17, wherein the unique sequence number identifies the data packet and denotes an order in which the data packet is broadcast in relation to other data packets.

22. The system of claim 21, wherein the unique sequence number contains enough digits to ensure that no two data packets receive identical sequence numbers.

23. The system of claim 21, wherein the unique sequence number is a 32-bit sequence number.

24. The system of claim 17, wherein using the unique sequence number to determine whether a previous data packet is missing comprises:

(i) comparing the unique sequence number to a last received unique sequence number, wherein in the last received unique sequence number corresponds to a data packet last received before the data packet; and

(ii) if the unique sequence number is not in sequence after the last received unique sequence number, then determining that a previous data packet is missing.

25. The system of claim 17, wherein the server stores the data packet if the archive is off line.

26. The system of claim 17, wherein the broadcast messaging software is TIB Rendezvous.

27. The system of claim 17, wherein the archive comprises a client component and an archiving process component,

5 wherein the client component is adapted to interface with the server, is adapted to receive and store the data packet broadcast by the server and the unique sequence number attached to the data packet, and is adapted to return an acknowledgement to the server indicating the unique sequence number of the received data packet, and

10 wherein the archiving process component is adapted to listen for a query from a requesting client of the plurality of clients, to read a referenced sequence number of the query, to retrieve a data packet corresponding to the referenced sequence number, and to return the data packet corresponding to the referenced sequence number to the requesting client.

15 28. The system of claim 27, wherein the client component and the archiving process component are a single software program.

29. The system of claim 27, wherein the client component is identical to software provisioned on the plurality of clients, except that the client component is modified to provide an acknowledgement to the server.

20 30. The system of claim 17, wherein the plurality of clients is a dynamic client set in which individual clients are dynamically added to or removed from the plurality of clients without requiring administrative changes at the server, and

wherein new clients are configured to pick up broadcasts from the server from a time that the new clients are added, and are configured not to request data packets transmitted prior to that time.

31. The system of claim 17, wherein the client stores the data packet and the previous data packet onto a disk.

32. The system of claim 31, wherein the data packet and the previous data packet include their unique sequence numbers, and wherein the unique sequence numbers are stored as part of a data packet file name.

33. The system of claim 31, wherein the data packet and the previous data packet include their unique sequence numbers, and wherein the unique sequence numbers are stored as part of contents of the data packet and the previous data packet.

34. The system of claim 17, wherein the client acts as an application program interface for a program that processes data packets, such that the data packets are delivered directly to the processing program.

35. The system of claim 17, wherein the server and the archive are a single physical computer.

36. The system of claim 17, wherein the server and the archive are separate physical computers.

37. A method for distributing data comprising:

(a) attaching a unique sequence number to each of a sequence of data packets;

(b) transmitting the data packets to a plurality of clients and to an archive;

(c) receiving the data packets at the archive;

(d) storing the data packets at the archive;

5 (e) determining whether a client of the plurality of clients has not received at least one of the data packets; and

(f) re-transmitting the data packets that have not been received by the client to the client.

38. The method of claim 37, wherein after the step of receiving the data packets
10 at the archive, the method further comprises sending an acknowledgement for the each of the sequence of data packets that is received.

39. The method of claim 38, wherein the acknowledgement references the unique sequence number for the each of the sequence of data packets that is received.

40. The method of claim 37, wherein the step of determining whether a client of
15 the plurality of clients has not received at least one of the data packets comprises identifying an absence of at least one unique sequence number at the client.

41. The method of claim 37, wherein transmitting the data packets to a plurality of clients and to an archive comprises broadcasting the data packets.

42. The method of claim 37, wherein re-transmitting the data packets that have
20 not been received by the client to the client uses a point-to-point communication.